

WHAT IS CLAIMED IS:

1. An electromagnetic wave detector comprising:
conversion elements for converting incident
electromagnetic waves or radiations into an electric
charge;

storage capacitors for storing the electric charge
produced by said conversion elements;

thin film read transistors connected respectively
to the corresponding storage capacitors and each having
a gate to which ON and OFF voltages are applied
respectively in readout and storage periods; and

thin film reset transistors connected respectively
to the corresponding storage capacitors and each having
a gate to which ON and OFF voltages are applied
respectively in reset and storage periods,

the OFF voltage applied to the gates of said thin
film reset transistors being set to a value closer to
the ON voltage applied to the gates of the thin film
reset transistors than the OFF voltage applied to the
gates of said thin film read transistor.

2. An electromagnetic wave detector according to
claim 1, wherein said conversion elements are adapted
to absorb electromagnetic waves showing an energy level
higher than visible light and convert them into an
electric charge.

3. An electromagnetic wave detector according to claim 1, wherein said thin film read transistors and said thin film reset transistors have a non-monocrystalline semiconductor layer formed on an
5 insulating substrate.

4. An electromagnetic wave detector according to claim 1, wherein
said thin film read transistors and said thin film
10 reset transistors are formed on an insulating substrate; and
said conversion elements are formed on a substrate different from said insulating substrate and electrically connected to said thin film read
15 transistors and said thin film reset transistors.

5. An electromagnetic wave detector according to claim 1, wherein
said conversion elements comprises a semiconductor
20 substrate having two opposite surfaces for converting electromagnetic waves into an electric charge, a common electrode arranged on the one surface of the semiconductor substrate and a plurality of electrodes formed on the other surface of the semiconductor
25 substrate and separated from each other in correspondence to a plurality of two-dimensional pixels;

said thin film read transistors and said thin film reset transistors are formed on an insulating substrate such that unit cells each including one of the thin film read transistors and one of the thin film reset
5 transistors are arranged on the insulating substrate in correspondence to the pixels; and

said semiconductor substrate and said insulating substrate form a layered structure and said plurality of electrodes and said unit cells are electrically
10 connected between the substrates.

6. An electromagnetic wave detector according to claim 5, wherein said semiconductor substrate is provided in plurality as arranged two-dimensionally on
15 said insulating substrate to form a layered structure and the common electrodes of the semiconductor substrates are mutually short-circuited.

7. An electromagnetic wave detector according to
20 claim 5, wherein a high voltage is applied to the common electrode of said conversion elements and a shielding conductor is arranged near the common electrode.

8. An electromagnetic wave detector according to
25 claim 1, wherein said thin film read transistors and said thin film reset transistors are formed on an

insulating substrate provided with a driver circuit for driving the thin film read transistors and the thin film reset transistors and with a read circuit for reading signals from said thin film read transistors.

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9. An electromagnetic wave detector comprising:
conversion elements for converting incident electromagnetic waves or radiations into an electric charge;
- 10 storage capacitors for storing the electric charge produced by said conversion elements; and
- thin film reset transistors connected respectively to the corresponding storage capacitors and each having a gate to which ON and OFF voltages are applied
- 15 respectively in reset and storage periods,
- any excessive electric charge being discharged by way of the thin film reset transistors in each storage period.

- 20 10. An electromagnetic wave detector according to claim 9, wherein said conversion elements are adapted to absorb electromagnetic waves showing an energy level higher than visible light and convert them into an electric charge.

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11. An electromagnetic wave detector according to claim 9, wherein said thin film reset transistors have

a non-monocrystalline semiconductor layer formed on an insulating substrate.

12. An electromagnetic wave detector according to
5 claim 9, wherein

thin film read transistors and said thin film
reset transistors are formed on an insulating
substrate; and

10 said conversion elements are formed on a substrate
different from said insulating substrate and
electrically connected to said thin film read
transistors and said thin film reset transistors.

13. An electromagnetic wave detector according to
15 claim 9, wherein

20 said conversion elements comprises a semiconductor
substrate having two opposite surfaces for converting
electromagnetic waves into an electric charge, a common
electrode arranged on the one surface of the
semiconductor substrate and a plurality of electrodes
formed on the other surface of the semiconductor
substrate and separated from each other in
correspondence to a plurality of two-dimensional
pixels;

25 thin film read transistors and said thin film
reset transistors are formed on an insulating substrate
such that unit cells each including one of the thin

film read transistors and one of the thin film reset transistors are arranged on the insulating substrate in correspondence to the pixels; and

5 said semiconductor substrate and said insulating substrate form a layered structure and said plurality of electrodes and said unit cells are electrically connected between the substrates.

10 14. An electromagnetic wave detector according to claim 13, wherein said semiconductor substrate is provided in plurality as arranged two-dimensionally on said insulating substrate to form a layered structure and the common electrodes of the semiconductor substrates are mutually short-circuited.

15 15. An electromagnetic wave detector according to claim 13, wherein a high voltage is applied to the common electrode of said conversion elements and a shielding conductor is arranged near the common
20 electrode.

25 16. An electromagnetic wave detector according to claim 9, wherein thin film read transistors and said thin film reset transistors are formed on an insulating substrate provided with a driver circuit for driving the thin film read transistors and the thin film reset transistors and with a read circuit for reading signals from said thin film read transistors.